

## CLAIMS

1. A system for compressing and decompressing information packets transmitted from a first terminal to a second terminal, comprising

5 suppression means in the first terminal adapted to use a predetermined suppression algorithm for removing at least one field that varies in a known pattern from a payload header of an information packet being transmitted to the second terminal; and

restoration means in the second terminal adapted to use a predetermined restoration algorithm for restoring the removed at least one field that varies in the known pattern to the payload header of an information packet received from the first terminal;

10 wherein the first and second terminals respectively include means for processing and exchanging service control messages that include encoding extensions identifying the removed at least one field that varies in the known pattern and indicating a scheme for restoring the identified at least one field; and

15 wherein for discrete transmitted information packets, the predetermined restoration algorithm includes the step of:

(a) restoring the at least one identified removed field that varies in the known pattern in accordance with the scheme for restoring the identified at least one field indicated by the encoding extensions.

2. A system according to Claim 1, wherein the suppression means is further adapted to use a predetermined suppression routine for removing fields having a fixed value from the payload header of the information packets being transmitted to the second terminal;

5 wherein the restoration means is further adapted to use a predetermined restoration routine that is complementary to the predetermined suppression routine for restoring the removed fixed-value fields to the payload header of information packets received from the first terminal; and

10 wherein the predetermined suppression routine, the predetermined restoration routine and the service control messages are in accordance with a DOCSIS payload-header-suppression (PHS) specification.

15 3. A system according to Claim 1, wherein step (a) includes the step of:  
(b) from time to time restoring the removed field by using an associated refresh field received with the information packet.

4. A system according to Claim 3, wherein for discrete information packets, the predetermined suppression algorithm includes the steps of:

20 (c) providing a refresh control field identifying a refresh field that is to be transmitted with the discrete information packet;

(d) providing the refresh field identified by the refresh control field for transmission to the second terminal with the discrete information packet; and

(e) providing a control field that includes the refresh control field for transmission

to the second terminal with the discrete information packet.

5. A system according to Claim 4, wherein for discrete transmitted information packets, the predetermined restoration algorithm further includes the step of:

5 (f) in accordance with the refresh control field received with the discrete information packet, identifying the associated refresh field received with the discrete information packet.

6. A system according to Claim 1, wherein one of the encoding extensions indicates a fixed partial value of a given field that is to be removed by the suppression means; and

wherein for discrete information packets, the predetermined suppression algorithm includes the step of:

15 (b) providing a variable remaining portion of the removed given field for transmission with the discrete information packet; and

wherein for discrete transmitted information packets, the predetermined restoration algorithm further includes the step of:

20 (c) restoring the removed given field by using the variable remaining portion of the removed given field received with the discrete information packet in combination with the fixed partial value of the given field.

7. A system according to Claim 1, wherein the suppression means provides constant-length compressed information packets for transmission to the remote terminal.

8. A system for compressing and decompressing information packets transmitted from a first terminal to a second terminal, comprising

suppression means in the first terminal adapted to use a predetermined suppression algorithm for removing at least one field that varies in a known pattern from a payload header of an information packet being transmitted to the second terminal; and

restoration means in the second terminal adapted to use a predetermined restoration algorithm for restoring the removed at least one field that varies in the known pattern to the payload header of an information packet received from the first terminal;

wherein the predetermined restoration algorithm includes the step of:

(a) from time to time restoring the at least one removed field that varies in the known pattern by using an associated refresh field received with the information packet.

9. A system according to Claim 8, wherein for discrete information packets, the predetermined suppression algorithm includes the steps of:

(b) providing a refresh control field identifying a refresh field that is to be transmitted with the discrete information packet;

(c) providing the refresh field identified by the refresh control field for transmission to the second terminal with the discrete information packet; and

(d) providing a control field that includes the refresh control field for transmission to the second terminal with the discrete information packet.

10. A system according to Claim 9, wherein for discrete transmitted information packets, the predetermined restoration algorithm further includes the step of:

(e) in accordance with the refresh control field received with the discrete information packet, identifying the associated refresh field received with the discrete information packet.

5           11. Apparatus for compressing information packets for transmission to a remote terminal, comprising

          suppression means adapted to use a predetermined suppression algorithm for removing at least one field that varies in a known pattern from a payload header of an information packet being transmitted to the remote terminal; and

10           means for processing and exchanging service control messages with the remote terminal, wherein the service control messages include encoding extensions identifying the removed at least one field that varies in the known pattern and indicating a scheme for restoring the identified at least one field;

15           wherein the suppression means provides constant-length compressed information packets for transmission to the remote terminal.

20           12. Apparatus according to Claim 11, wherein the suppression means is further adapted to use a predetermined suppression routine for removing fields having a fixed value from the payload header of the information packets being transmitted to the remote terminal; and

          wherein the predetermined suppression routine and the service control messages are in accordance with a DOCSIS payload-header-suppression (PHS) specification.

13. Apparatus according to Claim 11, wherein one of the encoding extensions indicates a fixed partial value of a given field that is to be removed by the suppression means; and

wherein for discrete information packets, the predetermined suppression  
5 algorithm includes the step of:

(a) providing a variable remaining portion of the removed given field for transmission to the remote terminal with the discrete information packet.

14. Apparatus for compressing information packets for transmission to a remote  
10 terminal, comprising

suppression means adapted to use a predetermined suppression algorithm for removing at least one field that varies in a known pattern from a payload header of an information packet being transmitted to the remote terminal;

wherein for discrete information packets, the predetermined suppression  
15 algorithm includes the steps of:

(a) providing a refresh control field identifying a refresh field that is to be transmitted with the discrete information packet;

(b) providing the refresh field identified by the refresh control field for transmission to the remote terminal with the discrete information packet; and

20 (c) providing a control field that includes the refresh control field for transmission to the remote terminal with the discrete information packet.

15. Apparatus for decompressing transmitted information packets received from a remote terminal, comprising

restoration means adapted to use a predetermined restoration algorithm for restoring a removed at least one field that varies in a known pattern to the payload header  
5 of an information packet received from the remote terminal;

means for processing and exchanging service control messages with the remote terminal, wherein the service control messages include encoding extensions identifying the removed at least one field that varies in the known pattern and indicating a scheme for restoring the identified at least one field; and

10 wherein for discrete transmitted information packets, the predetermined restoration algorithm includes the step of:

(a) restoring the at least one identified removed field that varies in the known pattern in accordance with the scheme for restoring the identified at least one field indicated by the encoding extensions.

15 16. Apparatus according to Claim 15, wherein step (a) includes the step of:

(b) from time to time restoring the removed field by using an associated refresh field received with the information packet.

20 17. Apparatus according to Claim 16, wherein for discrete transmitted information packets, the predetermined restoration algorithm further includes the step of:

(c) in accordance with a refresh control field received with the discrete information packet, identifying the associated refresh field received with the discrete

information packet.

18. Apparatus according to Claim 15, wherein one of the encoding extensions indicates a fixed partial value of a given field that is removed by the suppression means;

5 and

wherein for discrete information packets, the predetermined restoration algorithm further includes the step of:

(c) restoring the removed given field by using a variable remaining portion of the removed given field received with the discrete information packet in combination with the fixed partial value of the given field.

19. Apparatus for decompressing transmitted information packets received from a remote terminal, comprising

restoration means adapted to use a predetermined restoration algorithm for restoring a removed at least one field that varies in a known pattern to the payload header of an information packet received from the remote terminal;

wherein the predetermined restoration algorithm includes the step of:

(a) from time to time restoring the at least one removed field that varies in the known pattern by using an associated refresh field received with the information packet.

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20. Apparatus according to Claim 19, wherein for discrete information packets,  
the predetermined restoration algorithm further includes the step of:

(b) in accordance with a refresh control field received with the discrete  
information packet, identifying the associated refresh field received with the discrete  
5 information packet.